REMARKS

Reconsideration of the pending application is respectfully requested on the basis of the following particulars.

1. In the claims

As shown in the foregoing LIST OF CURRENT CLAIMS, the claims have been amended to more clearly point out the subject matter for which protection is sought.

Claim 1 is amended to incorporate the features of previously presented claims 4, 5, and 9. It is respectfully submitted that no new matter is added, since the changes merely merge the subject matter of previously presented claims.

Claims 2 and 3 remain canceled.

Claims 4, 5, and 9 are canceled and the subject matter thereof added to amended claim 1.

Claims 6 and 7 are a canceled to be consistent with amended claim 1.

Claim 10 remains canceled.

Claim 12 is amended to recite wherein the total of the solid solution formation element and the charge compensation element in the intermediate layers is 5 to 60 mol% in terms of the metal content. It is respectfully submitted that no new matter is added, since support for the amendment may be found, for example, at least in previous claim 9, as well as, for example, at least the descriptions of Examples 1, 2, 3, and 4, as discussed on pages 19-21 of the accompanying description in the specification as originally filed, where the total metal content is disclosed to respectively be 30 mol%, 40 mol%, 20 mol% and 20 mol%.

Claim 13 is canceled to be consistent with amended claim 12.

Claims 11, 18, 27, and 29 are left unchanged.

Entry of the LIST OF CURRENT CLAIMS is respectfully requested in the next Office communication.

2. Rejection of claims 1, 4-7, 9, 11, and 27 under 35 U.S.C. § 103(a) as being unpatentable over U.S. patent no. 6,764,770 (*Paranthaman et al.*) in view of U.S. publication no. 2004/0157747 (*Chen et al.*)

This rejection is rendered moot with respect to claims 4-7, and 9, by the cancelation thereof.

Reconsideration of this rejection is respectfully requested on the basis that the rejection fails to establish a *prima facie* case of obviousness with respect to amended claim 1, from which the remaining non-canceled claims 11 and 27 depend.

By way of review, amended claim 1 now requires, at least in part, an intermediate layer formed by sequentially disposing onto a metal substrate a first intermediate cerium-based oxide layer and a second intermediate cerium-based oxide layer, different from the first intermediate cerium-based oxide layer, where the first intermediate cerium-based oxide layer includes cerium and a solid solution formation element selected from the group consisting of Y, Nd, Sm, Gd, Eu, Yb, Ho, Tm, Dy, La and Er and the second intermediate cerium-based oxide layer includes cerium and a charge compensation element selected from the group consisting of Bi, Nb, Sb, Ta and V, wherein the total of the solid solution formation element and the charge compensation element in the intermediate layers is 5 to 60 mol% in terms of the metal content.

As discussed in detail in the specification, the formation of a first intermediate cerium-based oxide layer having a solid solution of Ce with a solid solution formation element selected from the group consisting of Y, Nd, Sm, Gd, Eu, Yb, Ho, Tm, Dy, La and Er prevents cracking of the cerium-oxide based layer and also lowers the melting point or crystallization temperature in a reaction treatment of crystallization (specification page 11, lines 22-24; page 13, lines 10-15).

The second intermediate cerium-based oxide layer having a charge compensation element selected from the group consisting of Bi, Nb, Sb, Ta and V, and which compensates for a charge mismatch between the respective ions of Ce and the solid solution formation element, inhibits ion diffusion in the oxide film (specification page 13, lines 18-23).

For clarification, while the cerium, solid solution formation element, and the charge compensation element recited in the claims are in ionic state during the coating of the metal substrate, after the combination of the cerium with the solid solution formation element and the charge compensation element, the charges are balanced, and the elements are no longer in the ionic state.

Turning to the *Paranthaman* publication, the Office action asserts on page 3 that claim 6 and Figure 1b of the *Paranthaman* publication discloses "a rare earth superconductor device comprising a metal substrate, an intermediate buffer layer containing an oxide of Mn along with at least one element of Ce, Y, Nd, Sm, Gd, Eu, Yb, Ho, Tm, Dy, and Er, a cerium oxide layer, and a surface layer of $REBa_2Cu_3O_7$ (e.g., YBCO)," and that the *Paranthaman* publication includes "a teaching for intermediate layers where cerium is paired with a solid solution formation element (Y, Nd, Sm, Gd, Eu, Yb, Ho, Tm, Dy, and Er).

However, a careful review of the disclosure and claims of the *Paranthaman* publication reveal that the features of amended claim 1 are not disclosed or fairly suggested.

As discussed in detail in columns 3 and 4 of the *Paranthaman* publication, as well as, for example, in claim 1b and 1c, a buffer layer is formed of a buffer consisting of $RMnO_3$ or $R_{1-x}A_xMnO_3$. Here, R is selected from the group consisting of Ce, Pr, Nd, Pm, Sm, Eu, Gd, Tb, Dy, Ho, Er, Tm, Yb, Lu, and Y (see specifically, for example, col. 3, lines 36-38).

Thus, if Ce is selected from this group, the *Paranthaman* publication discloses a buffer layer having either $CeMnO_3$ or CeA_xMnO_3.

Further, it is disclosed that A is selected from the group consisting of Be, Mg, Ca, Sr, Ba, and Ra (see specifically, for example, col. 3, lines 39-40).

Thus, the *Paranthaman* publication essentially discloses the following compositions:

$CeBeMnO_3$;

$CeMgMnO_3$;

$CeCaMnO_3$;

$CeSrMnO_3$;

$CeBaMnO_3$; and

$CeRaMnO_3$.

As a first observation, each of the disclosed $CeMnO_3$ or CeA_xMnO_3 compositions of the *Paranthaman* publication are also required to contain Mn. This is in contrast to the first intermediate cerium-based oxide layer recited in amended claim 1, which does not require the presence of Mn.

As a second observation, the first intermediate cerium-based oxide layer recited in amended claim 1 includes a solid solution formation element selected from Y, Nd, Sm, Gd, Eu, Yb, Ho, Tm, Dy, La, and Er; none of which is disclosed or suggested by the teachings of the *Paranthaman* publication to be included with a cerium-based oxide layer.

Further, as acknowledge on page 3 of the Office action, the *Paranthaman* publication "is silent with regards to a layer with cerium being paired with a charge compensation element (Bi, Nb, Sb, Ta, and V) in an oxide form."

Additionally, since the *Paranthaman* publication fails to disclose the two intermediate layers respectively having a solid solution formation element selected from Y, Nd, Sm, Gd, Eu, Yb, Ho, Tm, Dy, La, and Er and a charge compensation element selected from the group consisting of Bi, Nb, Sb, Ta and V, the *Paranthaman* publication must fail to disclose that the total of the solid solution formation element and the charge compensation element in the intermediate layers is 5 to 60 mol% in terms of the metal content, as is required by amended claim 1.

Thus, the *Paranthaman* publication fails to disclose or suggest every feature of amended claim 1.

The Office action turns to the *Chen* publication in an attempt to cure the deficiencies of the *Paranthaman* patent.

However, as indicated on pages 3-4 of the Office action dated June 16, 2009, and as discussed in paragraph [0036] and claims 7 and 8 of the *Chen* publication, the buffer layer of the *Chen* publication includes cerium oxide doped with group 2, IIA or 2A metal oxides, transition element oxides, lanthanide metal oxides, actinide metal oxides, or mixtures thereof. Also in paragraph [0036], the *Chen* publication provides specific examples of such materials suitable for use in the buffer layer, such as Sm_2O_3, Y_2O_3, Gd_2O_3, Pr_2O_3, CaO, SrO, or mixtures or combinations thereof.

While the *Chen* publication discloses the use of Bi in combination with other elements as a suitable material for use as a high Tc superconducting material, there is no specific disclosure in the *Chen* publication of a first intermediate cerium-based oxide layer including cerium and a solid solution formation element selected from Y, Nd, Sm, Gd, Eu, Yb, Ho, Tm, Dy, La, and Er and a second intermediate cerium-based oxide layer including cerium and a charge compensation element selected from Bi, Nb, Sb, Ta and V, as required by amended claim 1.

Further, while the *Chen* publication does disclose a buffer layer that can include multiple layers having a doped oxide or a combination of a doped oxide and an undoped

oxides or zirconia based oxide layers (paragraph [0041]), the *Chen* publication simply does not provide disclosure of a first intermediate cerium-based oxide layer including cerium and a solid solution formation element selected from Y, Nd, Sm, Gd, Eu, Yb, Ho, Tm, Dy, La, and Er and a second intermediate cerium-based oxide layer including cerium and a charge compensation element selected from Bi, Nb, Sb, Ta and V, as required by amended claim 1.

Thus, even if the examples of doped oxides disclosed in the *Chen* publication are added in place of the cerium oxide layer of the *Paranthaman* patent, the proposed combination thereof still fails to disclose a first intermediate cerium-based oxide layer including cerium and a solid solution formation element selected from Y, Nd, Sm, Gd, Eu, Yb, Ho, Tm, Dy, La, and Er and a second intermediate cerium-based oxide layer including cerium and a charge compensation element selected from Bi, Nb, Sb, Ta and V, as required by amended claim 1.

Additionally, while the *Chen* publication discloses, in an exemplary embodiment, a buffer layer having Sm oxide, where the Sm concentration is from about 1% to 35% (paragraphs [0036], [0040]), there is simply no disclosure in the *Chen* publication that the *total* of the solid solution formation element and the charge compensation element in the intermediate layers is 5 to 60 mol% in terms of the metal content, as is required by amended claim 1.

Thus, even if a person having ordinary skill in the art were to modify the buffer layers of the *Paranthaman* publication using the teachings of the *Chen* publication, they would not arrive at the specific intermediate layer as recited in amended claim 1, including the first and second intermediate layers respectively having a solid solution formation element selected from Y, Nd, Sm, Gd, Eu, Yb, Ho, Tm, Dy, La, and Er and a charge compensation element selected from the group consisting of Bi, Nb, Sb, Ta and V, and the total of the solid solution formation element and the charge compensation element in the intermediate layers is 5 to 60 mol% in terms of the metal content.

Accordingly, a *prima facie* case of obviousness cannot be established with respect to amended claim 1, and withdrawal of this rejection is respectfully requested.

3. Rejection of claims 12, 13, 18, and 28 under 35 U.S.C. § 103(a) as being unpatentable over U.S. patent no. 6,764,770 (*Paranthaman et al.*) in view of U.S. publication no. 2004/0157747 (*Chen et al.*) and further in view of U.S. patent no. 5,444,040 (*Kojima et al.*)

Reconsideration of this rejection is respectfully requested on the basis that the rejection fails to establish a *prima facie* case of obviousness with respect to amended claim 12, from which the remaining non-canceled claims 18 and 28 depend.

The method recited in amended claim 12 includes the features recited in amended claim 1, and discussed above in detail. In particular, amended claim 12 requires, at least in part, an intermediate layer formed by sequentially disposing onto a metal substrate a first intermediate cerium-based oxide layer and a second intermediate cerium-based oxide layer, different from the first intermediate cerium-based oxide layer, where the first intermediate cerium-based oxide layer includes cerium and a solid solution formation element selected from the group consisting of Y, Nd, Sm, Gd, Eu, Yb, Ho, Tm, Dy, La and Er and the second intermediate cerium-based oxide layer includes cerium and a charge compensation element selected from the group consisting of Bi, Nb, Sb, Ta and V, wherein the total of the solid solution formation element and the charge compensation element in the intermediate layers is 5 to 60 mol% in terms of the metal content.

The deficiencies of the *Paranthaman* and *Chen* publications are discussed above in detail with respect to amended claim 1, and are equally applicable here.

It is respectfully submitted that the *Kojima* patent fails to provide for the shortcomings of the *Paranthaman* and *Chen* publications, as discussed above in detail with respect to amended claim 1.

Therefore, a *prima facie* case of obviousness cannot be established with respect to amended claim 12, from which claims 18 and 28 depend, and withdrawal of this rejection is respectfully requested.

4. Conclusion

As a result of the amendment to the claims, and further in view of the foregoing remarks, it is respectfully submitted that the application is in condition for allowance. Accordingly, it is respectfully requested that every pending claim in the present application be allowed and the application be passed to issue.

Please charge any additional fees required or credit any overpayments in connection with this paper to Deposit Account No. 02-0200.

If any issues remain that may be resolved by a telephone or facsimile communication with the applicants' attorney, the examiner is invited to contact the undersigned at the numbers shown below.

BACON & THOMAS, PLLC
625 Slaters Lane, Fourth Floor
Alexandria, Virginia 22314-1176
Phone: (703) 683-0500
Facsimile: (703) 683-1080

Date: June 17, 2010

Respectfully submitted,

/Patrick M. Buechner/

PATRICK M. BUECHNER
Registration No. 57,504
for
GEORGE A. LOUD
Attorney for Applicants
Registration No. 25,814